REMARKS

Status of Claims

Claims 10-18 are all the claims pending in the application. Claims 1-9 have been canceled. Claims 10-18 are rejected.

Withdrawn Rejections

Applicants thank the Examiner for withdrawing the rejections under § 112, first paragraph and second paragraph.

Claim Rejections Under 35 U.S.C. § 103

Claims 10-18 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over Olsen *et al.* (WO 01/83707; "Olsen"), for the same reasons of record.

In addition, the Office Action asserts that Applicants' arguments that Olsen does not teach or suggest the use of chondroitin sulfate directly obtained from animal cartilage to treat psoriasis are not persuasive because the source of the chondroitin sulfate does not further limit the chondroitin sulfate used. The Office Action asserts that regardless of the source from which the chondroitin sulfate is obtained, both the claimed invention and Olsen use or suggest the use of the same compound.

The Office Action also asserts that Applicants' arguments that Olsen may suggest obtaining chondroitin sulfate from said cultured chondrocytes, but does not describe such a method is not persuasive because the present claims are not drawn to a method of producing chondrocytes or chrondroitin sulfate, and the manner in which the chrondroitin sulfate is produced or obtained does not change or alter the fact that Olsen suggests treating psoriasis in a mammal, with sodium chondroitin sulfate.

In addition, with regard to Applicants' arguments that Olsen does not disclose the characteristics of the chondroitin sulfate obtained from said cultured chondrocytes, nor the scientific data which demonstrates the beneficial effect of the chondroitin sulfate obtained from the *in vitro* cultured chondrocytes for treating psoriasis, the Office Action asserts that Olsen discloses that psoriasis in a mammal (human or animal) can be treated by administering to said mammal chondroitin sulfate. Also, the Office Action notes that the present claims do not recite the use of chondroitin sulfate that has specific characteristics or specific beneficial effects.

Further, the Office Action appears to assert that chondroitin sulfate obtained from chondrocytes cultures have a mean molecular weight of approximately 12,500 to 18,500 which is within the claimed average molecular weight. The Office Action cites Fellinis *et al.* for this contention.

In response, Applicants note that pursuant to M.P.E.P. § 2143, to establish a case of *prima facie* obviousness, the prior art reference must (1) provide some suggestion or motivation to one of ordinary skill in the art to modify the reference or teachings, (2) provide a reasonable expectation of success of obtaining the claimed invention, and (3) teach or suggest all the claim limitations.

Olsen is directed to a method of producing chondroitin sulphate from cultured chondrocytes. (See page 1, 1st paragraph of Olsen). These chondrocytes are cultured *in vitro* to obtain the anti-angiogenic, anti-inflammatoric, lysozomic and/or anti-collagenolytic fraction and/or collagen and/or chondroitin sulphate. (See page 6, last paragraph of Olsen). In particular, Olsen discloses that "it is important that the chondrocytes are at least partly denuded before culturing...[i.e.,] the chondrocytes are isolated from the extracellular matrix so that substantially no contamination of the culture medium with extra-cellular foreign matrix is at risk. Thereby

more pure fractions are obtained as compared to fractions obtained directly from cartilage [emphasis added]." (See page 10, 4th paragraph of Olsen). Accordingly, based upon this teaching in Olsen, one of ordinary skill in the art would have been discouraged from obtaining chondroitin sulphate directly from animal cartilage as in the claimed invention. Pursuant to M.P.E.P. § 2143.01, a proposed modification cannot render the prior art unsatisfactory for its intended purpose or change the principle of operation of a reference. In this case, Olsen teaches away from producing chondroitin sulphate from animal cartilage because such a modification would completely change the process by which Olsen obtains chondroitin sulphate, and render it unsatisfactory for its intended purpose. Thus, there is no suggestion or motivation in Olsen to obtain chondroitin sulphate obtained from enzymatic hydrolysis of animal cartilage, and use it as claimed.

In addition, it would not have been predictable for one of ordinary skill in the art to obtain chondroitin sulphate by enzymatic hydrolysis of animal cartilage because Olsen already discloses that "[c]ulturing of cartilage cells containing significant amounts of the anti-angiogenic facter is complicated by the inherent nature of cartilage tissue." (See page 4, lines 1-2 of Olsen). Also, in order to produce true cartilage tissue, Olsen discloses that "[a]lthough chondrocytes from a variety of animals and human beings have been cultured it has not been possible to obtain an anti-angiogenic fraction from these cultures." (See page 6, lines 9-11 of Olsen). Thus, there would not have been a reasonable expectation of success of obtaining the claimed invention based upon the teachings of Olsen.

Furthermore, as acknowledged by the Office Action, Olsen does not teach the use of an alkaline earth metal chondroitin sulfate as claimed. In addition, there is nothing in Olsen that teaches obtaining chondroitin sulfate as claimed.

Moreover, with regard to the disclosure in Olsen at page 1, lines 24-33, Applicants note that the (anti-angiogenic) fraction obtainable from said method is characterized in that it comprises substantially no molecules from contaminating cells, such as substantially no molecules from fat tissue, substantially no molecules from muscle tissue, and substantially no molecules from bone tissue. Furthermore, the fractions may comprise more active molecules as compared to the conventional fractions obtained from cartilage, thus it is possible to standardize a product comprising the fractions more easily. Also, the fractions according to Olsen may be obtained without killing a corresponding amount of animals, in particular sharks, for example by obtaining a biopsy from the living shark, such as a biopsy from the fin.

Furthermore, with regard to the Office Action's contention that Fellinis *et al.* teaches that chondroitin sulfate obtained from cultured chondrocytes has a mean molecular weight of approximately 12,500 to 18,500 (see page 6 of the Office Action), Applicants note the following. Fellinis *et al.* does not contradict what has been previously argued[1]. Fellinis *et al.* studied the polydispersity of proteoglycans synthesized by chondrocytes from the Swarm rat chondrosarcoma. Fellinis *et al.* does not describe how to obtain the chondroitin sulfate from *in vitro* cultured chondrocytes with the aim of an industrial application, i.e., preparation of a medicament. The purpose of Fellinis *et al.* is to study the biosynthesis of proteoglycans by means of a culture of chondrocytes. In this context, a portion of each subfraction of proteoglycan is treated with sodium borohydride and then purified by chromatography to obtain

[1] As previously argued, one of ordinary skill in the art of cellular cultures and glycosaminoglycans would know that obtaining chondroitin sulfate via *in vitro* cultured chondrocytes would be non-viable from an industrial and economic point of view due to the large amount of colonies of chondrocytes required to isolate a small amount of chondroitin sulfate for use in treating psoriasis (see page 7 of Amendment filed January 15, 2008).

different chains of chondroitin sulfate. Accordingly, Fellinis *et al.* does not teach or suggest a method to synthesize chondroitin sulfate.

Reconsideration and withdrawal of the rejection under § 103(a) is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Tu A. Phan/

Tu A. Phan, Ph.D.
Registration No. 59,392

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

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